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Customer Number

Patent
Case No.: 57120US002

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor:	GEAGHAN, BERNARD O.		
Application No.:	09/970474	Confirmation No.:	1153
Filed:	October 3, 2001		
Title:	TOUCH PANEL SYSTEM AND METHOD FOR DISTINGUISHING MULTIPLE TOUCH INPUTS		

BRIEF ON APPEAL

Mail Stop: Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This Brief is presented in support of the Appeal filed April 3, 2006, from the final rejection of Claims 1-38 of the above-identified application, as set forth in the Office Action mailed January 5, 2006.

☐ Please charge the fee provided in 37 CFR § 41.20(b)(2) to Deposit Account No. 13-3723. One copy of this sheet marked duplicate is also enclosed.

☐ Any required fee will be paid at the time of EFS-Web submission.

☒ If necessary, charge any required fee, or credit any overpayment to Deposit Account No. 13-3723.

A Notice of Appeal in this application was mailed on April 3, 2006, and was received in the USPTO on April 3, 2006.

REAL PARTY IN INTEREST

The real party in interest is 3M Company (formerly known as Minnesota Mining and Manufacturing Company) of St. Paul, Minnesota and its affiliate 3M Innovative Properties Company of St. Paul, Minnesota.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences known to Appellant, the Appellant's legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal for the above-referenced patent application.

STATUS OF CLAIMS

Claims 1-38 are pending and are the subject of this Appeal (Appendix 1, Claims). Claims 1, 15, 21, 26, 29, 30, 33 and 38 are independent claims.

Claims 1-8, 10-23, 24-27, 29-36 and 38 have been finally rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Pat. No. 6,723,929 (Kent).

Claim 9 has been finally rejected under 35 U.S.C. §103(a) as being unpatentable over Kent in view of U.S. Pat. No. 6,738,049 (Kiser).

Claims 23, 28 and 37 have been finally rejected under 35 U.S.C. §103(a) as being unpatentable over Kent in view of U.S. Pat. No. 6,819,313 (Abdelhadi).

STATUS OF AMENDMENTS

There have been no amendments presented in this application. The appealed claims as set forth in Appendix 1 are as originally filed.

SUMMARY OF CLAIMED SUBJECT MATTER

Appellants' claims recite touch systems and methods for distinguishing among multiple temporally overlapping touch inputs. Distinguishing from among two or more simultaneous or temporally overlapping touch inputs on a touch sensitive surface can cause difficulties ranging from ambiguity of touch position to an inability to register the position of any of the touch inputs. Appellants' claimed invention can overcome these difficulties, allowing a valid touch input position to be reported for at least one of the temporally overlapping touch inputs.

In claims 1-14, Appellants recite a method for distinguishing between two or more temporally overlapping touch inputs in a touch screen system, including the steps of: "(a) measuring signals caused by the two or more touch inputs; (b) measuring positional data for the touch inputs; (c) determining whether any of the signals exceeds a minimum threshold for a single touch input; (d) determining whether any of the signals exceeds a maximum threshold for a single touch input; and (e) calculating and reporting to the touch screen system a touch location using positional data that corresponds to any of the signals that exceeds the minimum threshold but that does not exceed the maximum threshold."

Illustration 1: FIGURE 3(a) of Appellants' Specification

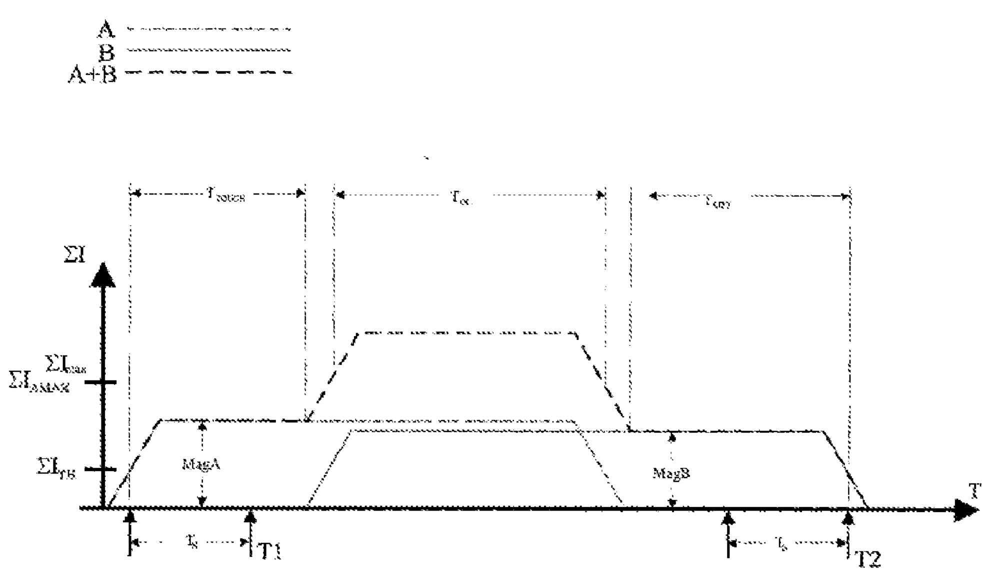


Fig. 3A

In reference to Illustration 1, when two touches, A and B, overlap in time and each are valid touches, the total signal received when either A or B is the only touch present is above the minimum threshold but below maximum threshold. During the time that touches A and B

coincide, the total signal is above the maximum threshold. The method recited in claims 1-14 would recognize each of these total signal states, and allow touch positions to be reported for either or both of touches A and B. Further, no touch location will be reported when the total signal exceeds the maximum threshold, thus avoiding an erroneous input.

In claims 15-20, Appellants recite a touch screen system that includes, "a processing unit for discriminating the touch-based user input signals to determine which signals correspond to temporally overlapping individual touch inputs by comparing a signal magnitude to one or more predetermined threshold values *and by performing one or more of monitoring a signal magnitude rate of change, monitoring a rate of change of calculated touch position, monitoring proximity of touch position to one or more designated active areas, or monitoring proximity of touch position to one or more designated regions of higher double touch probability*."

Illustration 2: FIGURE 1 of Appellants' Specification

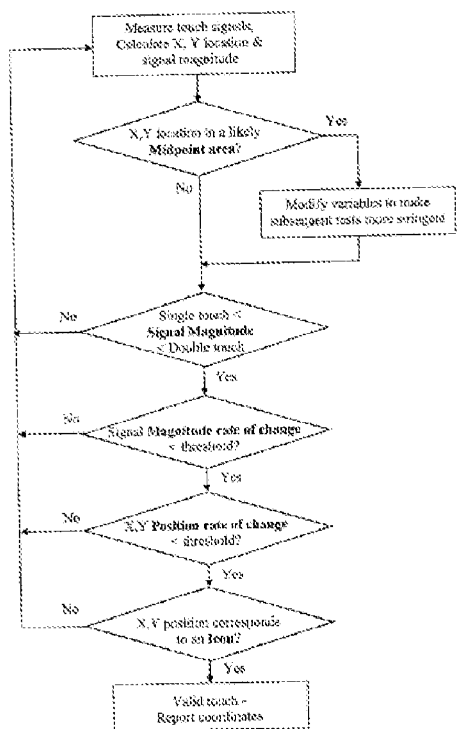


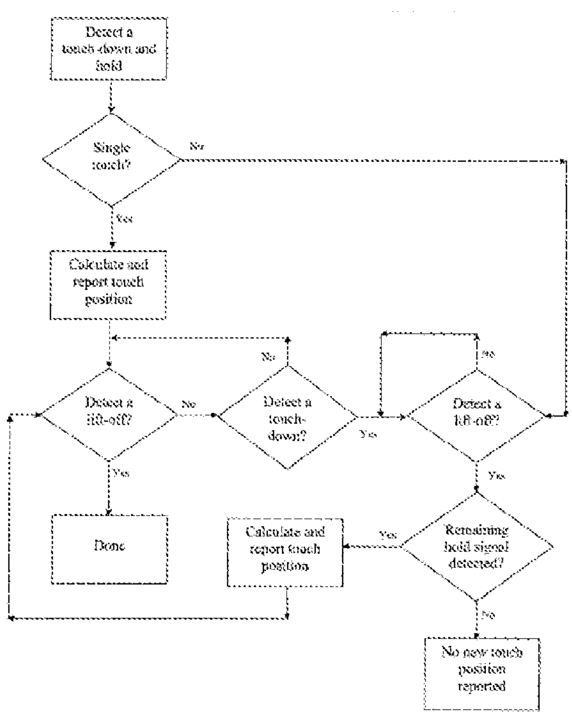
Fig. 1

In reference in Illustration 2, a touch system can distinguish among multiple touch inputs by monitoring one or more of various parameters such as (i) whether the calculated touch location resides in a midpoint area (a position more likely to result from a double touch), (ii)

whether the signal magnitude rate of change is higher than expected for a single touch, (iii) whether a sudden change in determined position indicates additional touches, and (iv) whether the calculated touch position corresponds to a designated area like an icon or falls within an area where touches are not expected. As recited in the claims, these parameters can be used alone or in combination, and are used along with total signal thresholds to ensure that at least one valid touch input exists.

In claims 21-25, Appellants recite a method for distinguishing multiple touch inputs including the steps of: "repeatedly measuring a signal caused by one or more touch inputs; monitoring rates of change of the signal; *correlating the rates of change of the signal with touch-down, hold, and lift-off events, to determine a sequence of said events; using the determined sequence of said events to determine a temporal ordering of the one or more touches*; calculating a touch location of at least one of the one or more touches given the determined sequence; and reporting the touch location."

<u>Illustration 3: FIGURE 2 of Appellants' Specification</u>



In reference to Illustration 3, the ordering of touch-down and lift-off events can be used along with total signal thresholds to determine whether a single or multiple touch condition exists. A touch-down event followed by another touch-down event without an intervening lift-

off event will signal a multiple touch condition, and no touch position will be reported. The signal is monitored for subsequent lift-off events in order to detect when a single touch condition exists so that a valid touch position can be reported.

In claims 26-29 and 33-37, Appellants recite methods for distinguishing multiple touch inputs that include "measuring a predetermined number of touch signals, each measurement taken at a predetermined time interval, each time interval being shorter than an expected touch input hold duration" and determining, calculating, or associating "a signal parameter for each of the signals." In claims 26-28, a touch location is calculated for each of the signals that is within a predetermined range, and a touch position is reported to the touch screen system for any of the calculated touch locations that is less than a predetermined distance away from any of the other calculated touch locations. In claim 29, a touch location is calculated for each of the signal parameters that is within a predetermined range, the predetermined range is adjusted and the calculating step is repeated for any touch location that is within a designated region corresponding to a higher probability of double touch events, and a touch position is reported to the touch screen system for the calculated touch locations. In claims 33-37, a touch location is calculated for each of the signals whose associated parameter is above a minimum threshold but below a maximum threshold, and a touch position is reported to the touch screen system for any of the touch locations calculated in the calculating step.

In claims 30-32, Appellants recite a method for distinguishing multiple touch inputs that includes: "determining a total signal from a set of measured touch signals; calculating a touch position from the set of measured touch signals when the total signal exceeds a minimum threshold value; performing one or both of (a) setting a test parameter for rate of change of total signal magnitude based on where the calculated touch position is located, and comparing the total signal magnitude to other recently measured total signal magnitudes to determine whether the test parameter for rate of change of total signal magnitude is satisfied, (b) setting a test parameter for rate of change of position based on where the calculated touch position is located, and comparing the touch position to other recently measured positions to determine whether the test parameter for rate of change of position is satisfied; and when the applicable test parameter or test parameters is satisfied, reporting the touch position when the total signal does not exceed a maximum threshold."

Illustration 4 shows flow charts that exemplify the various ways that parameters can be used to determine multiple touch conditions as recited in claims 26-37.

<u>Illustration 4: FIGUREs 6 and 7 of Appellants' Specification</u>

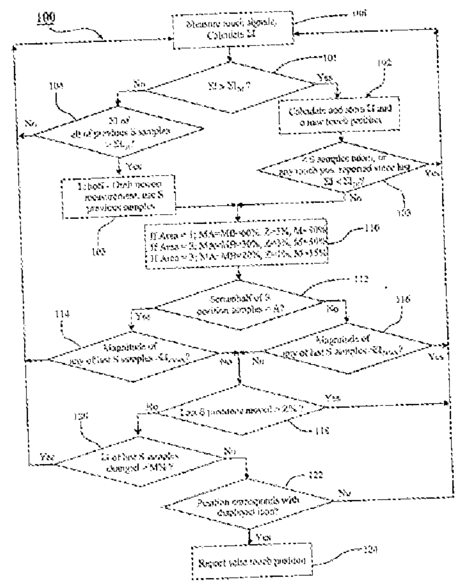


Fig. 6

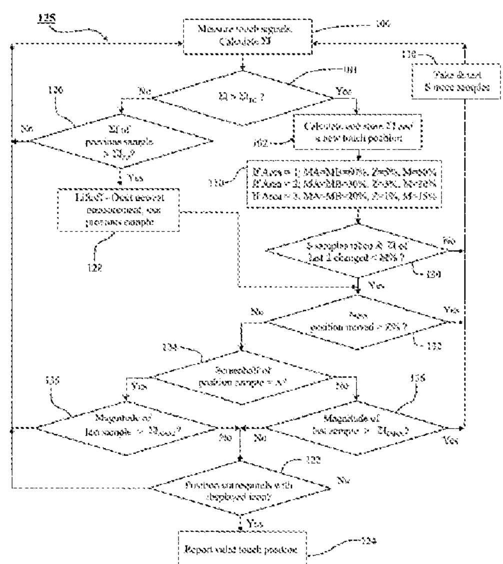


Fig. 7

In claim 38, Appellants recite a method for distinguishing phantom touch positions from valid touch positions during a double touch event in a touch screen system. The method includes the following steps: "independently measuring an X-coordinate position for each touch in the

double touch; independently measuring a Y-coordinate position for each touch in the double touch; determining a rate of change of magnitude of a measured signal corresponding to each X-coordinate position and each Y-coordinate position; matching X-coordinate positions with Y-coordinate positions based on similar rates of change; and reporting the matched X, Y coordinates as the valid touch positions."

<u>Illustration 5: FIGUREs 11(a)-(c) of Appellants' Specification</u>

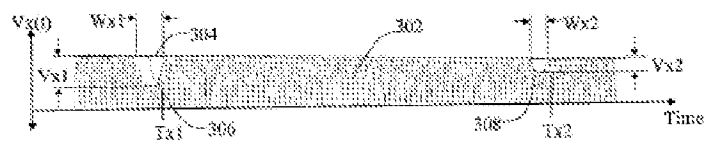


Fig. 11A

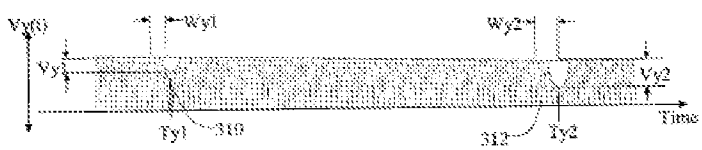


Fig. 11B

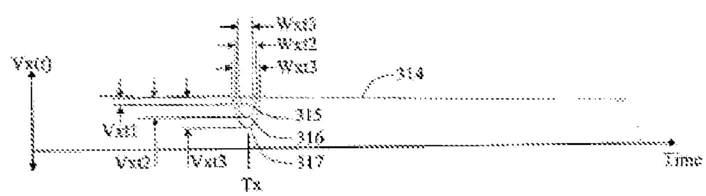


Fig. 11C

Some touch input technologies can inherently determine whether multiple touches exists, such those that use a reflected array of surface acoustic waves and measure their attenuation to independently determine x- and y-coordinates. The difficulty arises in that there is an ambiguity as to which x-coordinate matches with which y-coordinate. As show in Illustration 5, claim 38 recites a method whereby the rate of change of a selected parameter, such as attenuation width or depth, for each x-coordinate is matched to a similar rate of change for each y-coordinate, thus resolving the positional ambiguity. The method relies on the observation that the x- and y-coordinates corresponding to the same touch will exhibit similar rates of change in their signal parameters.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1-8, 10-23, 24-27, 29-36 and 38 have been finally rejected under 35 U.S.C. §102(e) as being anticipated by Kent.

Claim 9 has been finally rejected under 35 U.S.C. §103(a) as being unpatentable over Kent in view of Kiser.

Claims 23, 28 and 37 have been finally rejected under 35 U.S.C. §103(a) as being unpatentable over Kent in view of Abdelhadi.

The issue presented for review:

1. whether claims 1-8, 10-23, 24-27, 29-36 and 38 are novel over Kent;
2. whether claim 9 is patentable over Kent in view of Kiser; and
3. whether claims 23, 28 and 37 are patentable over Kent in view of Abdelhadi.

The claims are contained in Appendix I.

ARGUMENT

1. Claims 1-8, 10-23, 24-27, 29-36 and 38 are novel over Kent.

The claims rejected as being anticipated by Kent include all the independent claims, namely claims 1, 15, 21, 26, 29, 30, 33 and 38. Appellants submit that Kent does not disclose all the elements of any of these independent claims, and therefore does not anticipate.

Kent discloses a surface acoustic wave touch sensor that utilizes arrays of acoustic waves transmitted across the surface to detect touches. Kent acknowledges that surface acoustic wave touch sensors simultaneously experiencing two or more touches are subject ambiguities in positional determination. The ambiguity arises when trying to determine which of the multiple detected X coordinates matches with which of the multiple detected Y coordinates. Kent proposes resolving the ambiguity by timing and quantitative attenuation information (see Kent col. 43, lines 13-14). As for timing, Kent observes that if an (X1, Y1) coordinate touch has already been unambiguously established very recently before a double touch where the double touch coordinate possibilities are X1, X2, Y1 and Y2, it is highly likely that the second touch of the double touch has the coordinate (X2, Y2). As for quantitative attenuation, Kent observes that when double touches involve coordinate possibilities of X1, x2, Y1 and y2, where X1 and Y1 are strongly attenuated signals, while x2 and y2 are weakly attenuated signals, it is highly likely that the two touch coordinates are (X1, Y1) and (x2, y2). Kent also discloses the use of three or more sensor subsystems in conjunction with predicted time delays among them to resolve coordinate ambiguities for multiple simultaneous touch events.

In all, Kent's disclosure is specifically and exclusively focused on resolving coordinate ambiguities for a touch screen where the existence and number of multiple touches is readily known. The embodiments of Appellants' invention are applicable to many different touch detection technologies, including those where even identifying the existence of multiple temporally overlapping touches can be problematic. Each of Appellants' claims include features that are not disclosed by Kent, as set forth in the following discussion.

Independent claims 1, 30 and 33 include the step of determining whether the signal magnitude exceeds a minimum threshold for a single touch input and whether the signal exceeds a maximum threshold for a single touch input. When the signal exceeds the minimum threshold, at least one touch exists. When the signal exceeds the maximum threshold, at least two touches

exist. Kent does not disclose such use of signal thresholds. Rather, Kent discloses only that attenuation levels of known multiple touches may be matched to resolve positional ambiguities. Kent does not disclose, and would have no reason to consider, using a maximum threshold to identify multiple touch events since the touch screen of Kent inherently recognizes the existence of multiple touches. Furthermore, the touch screen system disclosed in Kent does not measure a signal magnitude in the manner recited in Appellants' claims. Rather, Kent independently detects each x-coordinate and each y-coordinate in a time-dependent manner such that a total signal magnitude cannot be obtained.

Independent claims 15, 21, 30 and 38 recite using rates of change of signal magnitude and/or calculated touch position to determine whether a simultaneous multiple touch has occurred. Similarly, claims 26, 29 and 33 recite taking multiple signal samples over a time period shorter that an expected touch duration, associating a parameter with each of the signal samples, and distinguishing single touch events from multiple touch events based on comparing the associated parameters to predetermined thresholds, adapted thresholds, or each other. Looking at discrete multiple signal samples taken over a short period of time as recited in Appellants' claims is akin to looking at rates of change. Kent does not disclose using signal or positional rates of change to identify multiple touch events. Rather, Kent discloses using timing, self-consistent delay times from multiple sensor subsystems, and attenuation magnitudes, as discussed previously. Nothing in Kent provides any appreciation for correlating rate of change information to multiple simultaneous touch identification.

As in claim 15 and various dependent claims, Appellants also recite using the proximity of the calculated touch position to designated areas as an indicator that multiple touches have occurred, such designated areas including designated active touch areas and areas of particularly high probability of resulting from multiple touches. For example, when a touch position determination lies sufficiently outside of the nearest active touch area (such as a designated icon), a multiple touch event may be indicated, in which case the touch position calculation can be ignored. Kent does not disclose correlating proximity of calculated touch positions to designated areas as a way of identifying multiple touches or as a way to resolve ambiguities in multiple touch coordinates.

For at least these reasons, Appellants have shown that every independent claims includes elements that are not disclosed or even suggested by Kent. Indeed, far from disclosing or

suggesting these elements, Kent exclusively teaches a system in which many of the elements recited in Appellants' claims would be undesirable or not even possible (for example, the use of a maximum total signal threshold).

In the Final Office Action, the Examiner's only response to Appellants' argument is that, "the features upon which applicant relies … are not recited in the rejected claim(s)." This is clearly not true. As is evident from the above discussion, Appellants have distinctly identified elements in each claim that are not present in the teach or disclosure of Kent.

Because Kent does not teach or suggest all the elements recited in any of Appellants' claims 1-8, 10-23, 24-27, 29-36 or 38, Kent cannot be said to anticipate these claims. Appellants submit that these claims are novel over Kent, and request favorable decision from the Board.

2. Claim 9 is patentable over Kent in view of Kiser.

Claims 9 recites a method, dependent on claim 1, "wherein different minimum and maximum threshold values can be assigned to different users." As discussed in detail above, Kent does not disclose all the elements of claim 1. Therefore, in order to state a prima facie case of obviousness using a combination of Kent with Kiser, the Examiner must show that Kiser cures all the deficiencies of Kent, that either Kiser or Kent additionally includes the subject matter recited in claim 9, that there is motivation to make the proposed combination, and that there is reasonable expectation of success. The Examiner has failed on all counts.

Kiser discloses a touchscreen input device that allows user customization of the screen layout. Kiser does not disclose using a minimum threshold for a single touch and a maximum threshold for a single touch, nor does Kiser disclose assigning different values for the minimum and maximum single touch thresholds to different users. As such, Kiser does not disclose the subject matter recited in claim 9, nor does Kiser adds anything that would even remotely tend to cure the deficiencies of Kent as discussed previously. Even so, Kent does not disclose a system that could make use of minimum and maximum single touch thresholds, as discussed above.

For at least these reasons, a prima facie case of obviousness has not be made. Appellants submit that claim 9 is patentable over Kent in view of Kiser, and request favorable decision from the Board.

3. Claims 23, 28 and 37 are patentable over Kent in view of Abdelhadi.

Claims 23, 28 and 37 are dependent claims that recite distinguishing multiple touch inputs from single touch inputs at least in part by proximity of a touch location calculation to a designated icon area. As discussed, Kent does not disclose all the elements of the underlying claims, and a prima facie case of obviousness can only be made if all the elements recited in the rejected claims are taught or suggested by the proposed combination.

Abdelhadi discloses providing a visual indication when a cursor control device is used to bring a cursor within a designated region on the screen, for example near an icon. Abdelhadi does not disclose touch screens, nor does Abdelhadi disclose making only certain areas active to inputs. Abdelhadi is instead concerned with providing a visual indication to a user that the cursor is within a designated area. Abdelhadi adds nothing that would cure the deficiencies of Kent as discussed previously. Appellants therefore submit that a prima facie case of obviousness has not be made, and request favorable decision from the Board.

CONCLUSION

For the foregoing reasons Appellant's claims 1-38 are patentable over the applied references. Appellants earnestly solicit a favorable decision from the Board on each of the issues presented.

Respectfully submitted,

June 5, 2006
Date

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CLAIMS APPENDIX

1. (Appealed) A method for distinguishing between two or more temporally overlapping touch inputs in a touch screen system comprising:

(a) measuring signals caused by the two or more touch inputs;

(b) measuring positional data for the touch inputs;

(c) determining whether any of the signals exceeds a minimum threshold for a single touch input;

(d) determining whether any of the signals exceeds a maximum threshold for a single touch input; and

(e) calculating and reporting to the touch screen system a touch location using positional data that corresponds to any of the signals that exceeds the minimum threshold but that does not exceed the maximum threshold.

2. (Appealed) The method of claim 1, further comprising the step of subtracting the positional data used in step (e) from positional data corresponding to any of the signals that exceeds the maximum threshold to calculate a touch location unreported by step (e).

3. (Appealed) The method of claim 1, further comprising determining which portions of the total signal correspond to touch-down, hold, and lift-off events of the two or more overlapping touch inputs.

4. (Appealed) The method of claim 1, further comprising the step of calculating and reporting a touch location when two sequential performances of steps (a) through (e) both result in no touch location being reported due to the signals exceeding the maximum threshold.

5. (Appealed) The method of claim 1, wherein at least one of the minimum and maximum thresholds are determined from a calibration step.

6. (Appealed) The method of claim 1, wherein the minimum and maximum thresholds comprise preset values.

7. (Appealed) The method of claim 1, wherein at least one of the minimum and maximum thresholds are updated during normal use of the touch screen system.

8. (Appealed) The method of claim 1, wherein at least one of the minimum and maximum thresholds are updated based on user touches within a designated region.

9. (Appealed) The method of claim 1, wherein different minimum and maximum threshold values can be assigned to different users.

10. (Appealed) The method of claim 1, wherein the total signal is a total electrical current measurement.

11. (Appealed) The method of claim 1, wherein the touch screen system comprises a capacitive touch screen.

12. (Appealed) The method of claim 1, wherein the touch screen system comprises a resistive touch screen.

13. (Appealed) The method of claim 1, wherein the touch screen system comprises a force-based touch screen.

14. (Appealed) The method of claim 1, wherein a touch location is reported in step (e) only if the touch location calculated in step (e) is contained within an area of the touch screen designated as a valid touch area.

15. (Appealed) A touch screen system comprising:

a touch panel for measuring touch-based user input signals;

an information display disposed for viewing through the touch panel; and

a processing unit for discriminating the touch-based user input signals to determine which signals correspond to temporally overlapping individual touch inputs by

comparing a signal magnitude to one or more predetermined threshold values and by performing one or more of monitoring a signal magnitude rate of change, monitoring a rate of change of calculated touch position, monitoring proximity of touch position to one or more designated active areas, or monitoring proximity of touch position to one or more designated regions of higher double touch probability.

16. (Appealed) The touch system of claim 15, wherein the touch panel is a capacitive touch panel.

17. (Appealed) The touch system of claim 15, wherein the touch panel is a resistive touch panel.

18. (Appealed) The touch system of claim 15, wherein the touch panel is a force-based touch panel.

19. (Appealed) The touch system of claim 15, wherein the touch panel is a surface acoustic wave touch panel.

20. (Appealed) The touch system of claim 15, wherein the touch system is part of a game system that allows at least two players to use the touch panel.

21. (Appealed) A method for distinguishing temporally overlapping touch inputs in a touch screen system comprising:

repeatedly measuring a signal caused by one or more touch inputs;

monitoring rates of change of the signal;

correlating the rates of change of the signal with touch-down, hold, and lift-off events, to determine a sequence of said events;

using the determined sequence of said events to determine a temporal ordering of the one or more touches;

calculating a touch location of at least one of the one or more touches given the determined sequence; and

reporting the touch location.

22. (Appealed) The method of claim 21, further comprising the step of determining that said touch location resides in an area of the touch screen designated as an active area.

23. (Appealed) The method of claim 22, wherein the active area corresponds to a displayed icon.

24. (Appealed) The method of claim 21, wherein the step of reporting said touch location is not performed for a calculated touch location if said touch location has moved more than a predetermined distance from a preceding calculated touch location.

25. (Appealed) The method of claim 21, further comprising the step of comparing a magnitude of the signal to a minimum threshold value and a maximum threshold value so that the reporting step is only performed for touch locations that correspond to signals whose magnitude exceeds the minimum threshold but does not exceed the maximum threshold.

26. (Appealed) A method for distinguishing valid touch inputs among temporally overlapping touch inputs in a touch screen system comprising:

measuring a predetermined number of touch signals, each measurement taken at a predetermined time interval, each time interval being shorter than an expected touch input hold duration;

calculating a signal parameter for each of the signals;

calculating a touch location for each of the signals that is within a predetermined range; and

reporting a touch position to the touch screen system for any of the calculated touch locations that is less than a predetermined distance away from any of the other calculated touch locations.

27. (Appealed) The method of claim 26, further comprising the step of determining that said touch location resides in an area of the touch screen designated as an active area.

28. (Appealed) The method of claim 27, wherein the active area corresponds to a displayed icon.

29. (Appealed) A method for distinguishing valid touch inputs among temporally overlapping touch inputs in a touch screen system comprising:

measuring a predetermined number of touch signals, each measurement taken at a predetermined time interval, each time interval being shorter than an expected touch input hold duration;

determining a signal parameter for each of the signals;

calculating a touch location for each of the signal parameters that is within a predetermined range;

adjusting the predetermined range and repeating the calculating step for any touch location that is within a designated region corresponding to a higher probability of double touch events; and

reporting a touch position to the touch screen system for the calculated touch locations.

30. (Appealed) A method for distinguishing valid touch inputs among temporally overlapping touch inputs in a touch screen system comprising:

determining a total signal from a set of measured touch signals;

calculating a touch position from the set of measured touch signals when the total signal exceeds a minimum threshold value;

performing one or both of

(a) setting a test parameter for rate of change of total signal magnitude based on where the calculated touch position is located, and comparing the total signal magnitude to other recently measured total signal magnitudes to determine whether the test parameter for rate of change of total signal magnitude is satisfied,

(b) setting a test parameter for rate of change of position based on where the calculated touch position is located, and comparing the touch position

to other recently measured positions to determine whether the test parameter for rate of change of position is satisfied; and

when the applicable test parameter or test parameters is satisfied, reporting the touch position when the total signal does not exceed a maximum threshold.

31. (Appealed) The method of claim 30, wherein the maximum threshold is set based on location of the touch position.

32. (Appealed) The method of claim 30, wherein the touch position is reported only if the touch position corresponds to an designated active area.

33. (Appealed) A method for distinguishing valid touch inputs among temporally overlapping touch inputs in a touch screen system comprising:

measuring a predetermined number of touch signals, each measurement taken at predetermined time intervals, the time intervals being shorter than an expected touch input hold duration;

associating a signal parameter with each of the signals;

calculating a touch location for each of the signals whose associated parameter is above a minimum threshold but below a maximum threshold; and

reporting a touch position to the touch screen system for any of the touch locations calculated in the calculating step.

34. (Appealed) The method of claim 33, wherein the signal parameter is a total signal magnitude.

35. (Appealed) The method of claim 33, wherein the signal parameter is a signal magnitude rate of change.

36. (Appealed) The method of claim 33, wherein the signal parameter is a rate of change of position.

37. (Appealed) The method of claim 33, wherein the signal parameter is proximity to an icon placement.

38. (Appealed) A method for distinguishing phantom touch positions from valid touch positions during a double touch event in a touch screen system comprising:

independently measuring an X-coordinate position for each touch in the double touch;

independently measuring a Y-coordinate position for each touch in the double touch;

determining a rate of change of magnitude of a measured signal corresponding to each X-coordinate position and each Y-coordinate position;

matching X-coordinate positions with Y-coordinate positions based on similar rates of change; and

reporting the matched X, Y coordinates as the valid touch positions.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.